

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Prior Application: S. IMASU et al  
Serial No. 09/048,054  
Filed: March 26, 1998

Group Art Unit: 2841  
Examiner: J. Vigushin  
For: PROCESS FOR MOUNTING ELECTRONIC  
DEVICE AND SEMICONDUCTOR DEVICE

3/B  
3/6/01  
M. L. Bridges

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents  
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend the  
above-identified application as follows:

IN THE SPECIFICATION:

Page 7, line 18, after "board)" insert "--of the bump  
electrodes--.

Page 8, line 2, change "Fig. 4 is sections" to --Figs.

4(A), 4(B) and 4(C) are sectional views--.

Page 8, line 2, change "Fig. 4 is sections" to  
--Figs. 4(A), 4(B) and 4(C) are sectional views--;

line 25, change "B - B" to --II - II--.

Page 9, line 2, change "C - C" to --III - III--;

line 22, change "A - A" to --I - I--.

Page 22, line 18, after "(a section)." insert

--In this case also, as shown in Fig. 11, the passivation film  
5 is not formed between the semiconductor chip 10 and the soft  
layer 3.--

0976943.013601

B1

B2

Page 27, line 18, change "B - B" to --II - II--;

line 20, change "C - C" to --III - III--.

IN THE CLAIMS

Cancel claim 1, and add new claims 14-31 as follows:

--14. An electronic device, comprising:

a semiconductor chip having a first surface and a second surface which is opposite to said first surface, a plurality of semiconductor elements and a plurality of external terminals formed on said first surface, a plurality of bumps formed on and electrically connected to said plurality of external terminals, respectively;

a wiring board having a main surface, an insulating layer formed over said main surface, a plurality of conductive films formed on said insulating layer, a passivation film that covers first portions of said plurality of conductive films at the outside of said semiconductor chip;

wherein said semiconductor chip is fixed to said wiring board through an adhesive between said first surface of said semiconductor chip and said insulating layer and said plurality of bumps being electrically connected to second portions of said plurality of conductive films at the inside of said semiconductor chip, respectively; and

wherein a distance between said second portions of conductive films and said first surface of said semiconductor chip is smaller than the thickness of said passivation film.

Cont  
B3

--15. An electronic device according to claim 14, further comprising recesses in said conductive films, and wherein said plurality of bumps are electrically connected to said plurality of electrode pads in said recesses, respectively.

--16. An electronic device according to claim 15, wherein said wiring board is comprised of rigid substrate that is more rigid than said insulating layer.

--17. An electronic device according to claim 14, wherein said plurality of bumps are fixed to said plurality of external terminals and pressed to said plurality of conductive films on said insulating layer.

--18. An electronic device according to claim 14, wherein said insulating layer is made of a material having a smaller coefficient of thermal expansion than that of said adhesive.

--19. An electronic device according to claim 14, wherein said adhesive is made of an anisotropic conductive resin film.

--20. An electronic device, comprising:  
a semiconductor chip having a first surface and a second surface which is opposite to said first surface, a plurality of semiconductor elements and a plurality of external terminals formed on said first surface, a plurality

of bumps formed on and electrically connected to said plurality of external terminals, respectively;

Cont  
B3  
a wiring board having a main surface, an insulating layer formed over said main surface, a plurality of conductive films formed on said insulating layer, a passivation film that covers first portions of said plurality of conductive films at the outside of said semiconductor chip;

09769243-012601  
wherein said semiconductor chip is fixed to said wiring board through an adhesive between said first surface of said semiconductor chip and said insulating layer and said plurality of bumps being electrically connected to second portions of said plurality of conductive films at the inside of said semiconductor chip, respectively; and

wherein a distance between said insulating layer and said first surface of said semiconductor chip at the inside of said semiconductor chip is smaller than a distance between said insulating layer and an upper surface of said passivation film at the outside of said semiconductor chip.

--21. An electronic device according to claim 20, further comprising recesses in said conductive films, and

wherein said plurality of bumps are electrically connected to said plurality of electrode pads in said recesses, respectively.

--22. An electronic device according to claim 21, wherein said wiring board is comprised of rigid substrate that is more rigid than said insulating layer.

Cond  
B3  
09769943.016601

--23. An electronic device according to claim 20, wherein said plurality of bumps are fixed to said plurality of external terminals and pressed to said plurality of conductive films on said insulating layer.

--24. An electronic device according to claim 20, wherein said insulating layer is made of a material having a smaller coefficient of thermal expansion than that of said adhesive.

--25. An electronic device according to claim 20, wherein said adhesive is made of an anisotropic conductive resin film.

--26. An electronic device, comprising:

a semiconductor chip having a first surface and a second surface which is opposite to said first surface, a plurality of semiconductor elements and a plurality of external terminals formed on said first surface, a plurality of bumps formed on and electrically connected to said plurality of external terminals, respectively;

a wiring board having a main surface, an insulating layer formed over said main surface, a plurality of conductive films formed on said insulating layer, a passivation film that covers first portions of said plurality of conductive films at the outside of said semiconductor chip;

Cont  
B3  
09769243-012601

wherein said semiconductor chip is fixed to said wiring board through an adhesive between said first surface of said semiconductor chip and said insulating layer and said plurality of bumps being electrically connected to second portions of said plurality of conductive films at the inside of said semiconductor chip, respectively; and

wherein said adhesive directly adheres between said insulating layer and said first surface of said semiconductor chip at the inside of said semiconductor chip.

--27. An electronic device according to claim 26, further comprising recesses in said conductive films, and wherein said plurality of bumps are electrically connected to said plurality of electrode pads in said recesses, respectively.

--28. An electronic device according to claim 27, wherein said wiring board is comprised of rigid substrate that is more rigid than said insulating layer.

--29. An electronic device according to claim 26, wherein said plurality of bumps are fixed to said plurality of external terminals and pressed to said plurality of conductive films on said insulating layer.

--30. An electronic device according to claim 26, wherein said insulating layer is made of a material having a smaller coefficient of thermal expansion than that of said adhesive.

Cont  
R3

--31. An electronic device according to claim 26,  
wherein said adhesive is made of an anisotropic conductive  
resin film.--

REMARKS

Claims 1-13 have been canceled. Claims 14-31 are  
pending.

Examination is requested.

Respectfully submitted,

*John R. Mattingly*  
John R. Mattingly  
Registration No. 30,293  
Attorney for Applicant(s)

MATTINGLY, STANGER & MALUR, P.C.  
104 East Hume Avenue  
Alexandria, Virginia 22301  
(703) 684-1120  
Date: January 26, 2001

09769943.01601